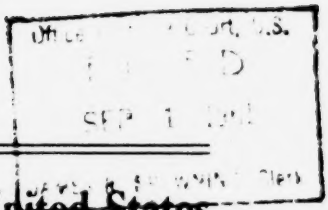

In the Supreme Court of the United States

OCTOBER TERM 1960.

No. 184.

FLOYD A. FIRESTONE,

Petitioner,

and

SPERRY PRODUCTS, INC., and
UNITED AIRCRAFT CORPORATION,

Involuntary Petitioners,

vs.

ALUMINUM COMPANY OF AMERICA,
ELECTRO-CIRCUITS INC. and
CURTISS-WRIGHT CORPORATION,

Respondents.

PETITIONER'S REPLY BRIEF

In Support of the Petition for a Writ of Certiorari to the United States Court of Appeals for the Sixth Circuit.

ALBERT R. TEARE,
1114 Terminal Tower,
Cleveland 13, Ohio,
Attorney for Petitioner.

TEARE, FETZER & TEARE,
DONALD A TEARE,
Of Counsel for Petitioner.

THE GATES LEGAL PUBLISHING CO., CLEVELAND, OHIO—MAIN 1-8647

TABLE OF CONTENTS.

Re: Petitioner's First Question 1

Re: Petitioner's Second Question 5

Re: The Combination Claims of the Fourth Question 12

Re: Petitioner's Third Question 14

Re: The Public Policy Portion of Petitioner's Fourth Question 18

TABLE OF AUTHORITIES.

Cases Cited or Distinguished.

Ansonia Brass & Copper Co. v. Electrical Supply Co., 144 U. S. 11 9

A & P case 19, 20

Cuno case 19, 20

Detrola Corp. v. Hazeltine Corp., 313 U. S. 259 20

General Electric Co. v. Jewel Incandescent Lamp, 326 U. S. 242 9, 10, 11

Technidyne Corp. v. McPhilben-Keator, 72 F. 2d 242 21

Statutes.

Patent Act of 1952, Section 101 18, 22

Patent Act of 1952, Section 103 3, 5, 11, 18, 22

In the Supreme Court of the United States

OCTOBER TERM 1960.

No. 184.

FLOYD A. FIRESTONE,

Petitioner,

and

SPERRY PRODUCTS, INC., and
UNITED AIRCRAFT CORPORATION,

Involuntary Petitioners,

vs.

ALUMINUM COMPANY OF AMERICA,
ELECTRO-CIRCUITS INC. and
CURTISS-WRIGHT CORPORATION,

Respondents.

PETITIONER'S REPLY BRIEF

In Support of the Petition for a Writ of Certiorari to the United States Court of Appeals for the Sixth Circuit.

Re: PETITIONER'S FIRST QUESTION.

Contrary to Respondent's assertions, the Trial Court *did* find the damping element to be unanticipated by the prior art, and the Appellate Court reversed this finding. The Trial Court pointed out (793a) that:

> "* * * Claims 19 and 32 * * * relate to the damping feature of the patent * * *"

The Trial Court then discussed the prior art and held (794a) that

> "* * * claims 19 and 32 are not anticipated * * *"

The Appellate Court reversed this finding by stating (12a of Petitioner's Appendix) that:

> "It is known that crystal damping was in use before Dr. Firestone's adaption of it in patent No. 2 (Fishleigh 325a)."

The finding was clearly reversed. The reversal was critical to the outcome of the Appeal as the Appellate Court's finding of lack of invention was based in part on such reversal. The Appellate Court held (page 15a of Petitioner's Appendix) that:

> "Here the claims in suit involve a heterodyne amplifier which is old, damping of the crystal which was previously known and a combination of the two which resulted in detecting flaws closer to the surface than could be done with patent No. 1. The parts performed the same function and operated in the same way as they did in the original patent. The difference in result was one of degree. It was only a refinement such as one skilled in the art could have achieved from the disclosures of the first patent. This is not invention."

In fact, the reversal of invention of claims 19 and 32 was based entirely on the finding of lack of novelty of crystal damping as these claims do not contain the heterodyne amplifier. The important question, however, is *how* the Appellate Court made the reversal. The question is whether the Appellate Court erred in reversing a finding as to what the prior art showed without examining and ruling on the prior art. Not only does the Appellate Court not discuss the prior art, but it expressly states (p. 16a of Petitioner's Appendix) that:

> "For the reasons herein stated, we find that claims 16, 19, 20, 25, 26, 29 and 32 are invalid for lack of

> invention over patent No. 1. Arriving at this conclusion it is not necessary to discuss anticipation by prior art."

Without considering and discussing the prior art, how can the Appellate Court (1) know whether damping elements are old or new or (2) whether Petitioner's device is invention over what is old? And equally important, how can the bench and bar be guided as to what does constitute invention?

Petitioner's Patent No. 1 does not show or suggest that the novel element of damping be added to the crystal. In order to show lack of invention it was necessary for the Appellate Court to find that a known type of crystal with known properties was substituted for the crystal of patent No. 1 and that such a substitution would be obvious to one skilled in the art. In order to determine whether such damped crystal existed in the prior art it was necessary for the Appellate Court to examine the prior art to determine, as a question of fact, whether the prior art showed damping. The Trial Court had held that it did not. The test of invention of Section 103 of the Patent Act is clear. Section 103 requires a consideration of:

> "* * * the differences between the subject matter sought to be patented and the prior art * * *"

The Appellate Court overlooked the clear requirement of the statute to examine the prior art and deferred instead to the judgment of an adverse witness as to what the adverse witness thought the prior art disclosed. Such a procedure is not only an improper transfer of the decision making power, but it also provides no guide to the bench and bar.

Respondent has attempted to give the impression that the Appellate Court considered evidence not considered

by the Trial Court. This is not so. The only matter relied on by the Appellate Court in support of its statement that the damping element is old is the opinion of Respondent's expert, Fishleigh. In discussing the file-wrapper and letters and the testimony of Petitioner, the Appellate Court was concerned with the utility and capabilities of the device of the No. 2 patent. (This will be discussed under the heading of Question Three.) The Appellate Court was not concerned with the novelty or lack thereof of the damping element. This is apparent from the face of the Appellate Court's opinion. Yet Respondent at pages 9 and 10 erroneously discusses these references as though the Appellate Court was relying on them for the question of novelty of the damping element, which clearly was not the case.

With respect to the prior art which the Appellate Court did not discuss but which is asserted by Respondent as "clearly" showing "that crystal damping was old and well known in the art," the Trial Judge had concluded (793a) that Sokolov "does not teach how the damping is to be accomplished and, as hereinbefore noted, a foreign reference is good only for what it clearly teaches." The Trial Judge had also listened to defendants' expert Fishleigh concede (330a) that the Round patent shows *no crystal*. Furthermore, the devices of Sawyer and British No. 473,636 were not ultrasonic and were both file wrapper references (1280.13b, 937a) and the patent office had granted patent No. 2 over them. In the face of such feeble references as Round, Sawyer and British 473,636, it is not surprising that the Trial Judge made no specific mention of them when he discussed the prior patents "at great length." (App. to Pet., p. 14a.) Neither did the Court of Appeals make any analysis or evaluation of them whatever. Respondents therefore have no support for their

irresponsible assertion (p. 9) that "*All of these patents* show clearly that crystal damping was old and well known in the art" (emphasis supplied).

The Appellate Court failed to comply with Section 103 of the Patent Act requiring a comparison of the alleged invention to the prior art. The Appellate Court erred in reversing a finding of fact without examining those facts. The Appellate Court's holding of lack of invention of claims 19, 20, 26 and 32 should be reversed.

Re: PETITIONER'S SECOND QUESTION.

Petitioner's second question, like the first, relates to the Appellate Court's reversal of a finding of novelty of an element. The element involved here is a heterodyne amplifier having an intermediate frequency higher than the signal frequency. Claims 16, 25 and 29 are drawn to the amplifier, claims 20 and 26 to the amplifier in combination with the damped crystal. Thus any holding of claims 16, 25 and 29 stands separate from a holding on claims 19 and 32 discussed in Question 1 which related solely to the damping of the crystal.

The Appellate Court's error in considering claims 16, 20, 25, 26 and 29 was in failing to examine the prior art (1) to determine whether heterodyne amplifiers were old in the flaw detection art and, if not (2) whether the use of such amplifier would be obvious to one skilled in such art. Section 103 of the Patent Act requires such an examination. Section 103 provides that the test is whether:

> "* * * The difference between the subject matter as a whole and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to *a person having ordinary skill in the art to which said subject matter pertains.*" (Emphasis added.)

The Trial Court made such an examination of the prior art, and found (797a) that Petitioner:

> "* * * used the heterodyne amplifier in the different art of non-destructive testing by the new technique of the ultrasonic pulse echo method to effect the novel and useful result * * *"

The Appellate Court, on the other hand, held (p. 16a of Petitioner's Appendix) that:

> "* * * it is not necessary to discuss anticipation by the prior art."

The Appellate Court based its reversal solely upon an alleged admission of Petitioner that heterodyne amplifiers were old.

The Appellate Court states (page 12a of Petitioner's Appendix) that Dr. Firestone:

> "concedes that the heterodyne amplifier was old in the art * * *"

The Appellate Court attempted to support this statement by quoting from Dr. Firestone's testimony. An examination of the quotation, on the face of the opinion, discloses nothing about the art to which Dr. Firestone is referring. Dr. Firestone was speaking about the art of radio. And, what is equally important, Dr. Firestone states in the quotation relied on by the Appellate Court that he discovered the heretofore unknown rapid sensitivity recovery characteristic of heterodyne amplifiers. Before the Appellate Court reversed the Trial Court's *finding of fact* as to novelty of the heterodyne amplifier in the flaw detection art and the *finding of invention* in the discovery of the unknown property which produced the new result, it was the duty of the Appellate Court under Section 103 of the Patent Act to determine:

(1) in what art the heterodyne amplifier was old

(2) whether such art was analogous to or different from the flaw detection art

(3) whether the rapid sensitivity recovery characteristics of the heterodyne amplifier was known or utilized in any art whatsoever, and

(4) whether it would be obvious to a person of ordinary skill in the flaw detection art to use an element which has not been used before in such art and which has not been known to have the characteristic which makes it desirable in the flaw detection art, or any other art.

The Appellate Court did not ask such questions.

Respondent attempted to excuse the Court's error by arguing at page 11 of its Brief that

> "*The claims are not limited to the flaw detection art.*" (Emphasis of Respondent.)

Such assertion is astounding in view of the language on the face of the claims. Claims 16, 20, 25, 26 and 29, containing the element of the heterodyne amplifier commence as follows:

> "16. In a device for the inspection of measurement of a part * * *."
>
> "20. In a device, for the inspection or measurement of a part * * *."
>
> "25. In an apparatus for inspecting materials * * *."
>
> "26. The combination of claim 25 * * *."
>
> "29. In combination, an electromechanical transducer adapted to be placed in mechanical contact with a material to be tested * * *."

Respondent further appears to argue that the Appellate Court's error would not be fatal as the prior art discloses the problem of "resolving power" and in Respondent's (not the Appellate Court's) opinion this is the same

as the "blocking" problem discovered and solved by Petitioner. This same argument was raised before the Trial Court and emphatically rejected. The District Court, having examined the prior art, had an accurate comprehension of this problem and set it forth with great clarity in its Opinion as follows (796a-797a):

> "Defendants contend that by his reference to the 'blocking' of an amplifier Firestone merely describes in a new way the characteristics of a wide band pass or short time constants which increased the ability of the receiver to distinguish pulses separated by short intervals of time. This contention fails to recognize the true meaning of the term 'blocking' and the object accomplished by the use in the Firestone patent of a heterodyne amplifier whose intermediate frequency is higher than the signal frequency. In an amplifier having a sufficiently wide band width pulses closely following each other will get through without overlapping. The 'blocking' to which Firestone refers is the paralysis which overtakes an amplifier irrespective of its band width when the amplifier is overloaded by a signal of too high amplitude. The powerful thrust of the input signal of Firestone's device resulted in paralysis or loss of sensitivity of the amplifier. Firestone was therefore confronted with the problem of providing an amplifier which would recover its sensitivity within approximately one millionth of a second so that it would be sensitive to the feeble train waves reflected back to the crystal from flaws distant only a fraction of an inch from the sending point. Firestone solved this problem by the use of the heterodyne amplifier whose intermediate frequency was greater than the signal frequency."

It is significant that Dr. Firestone's discovery was so revolutionary in character that no word existed in the scientific dictionary or literature to describe it.

Neither *Ansonia Brass & Copper Co. v. Electrical Supply Co.*, 144 U. S. 11 nor *General Electric Co. v. Jewel Incandescent Lamp*, 326 U. S. 242 referred to by Respondent at page 10 of its Brief is applicable. In the *Ansonia* case, not only was the process old, but the characteristic relied upon was also known. The alleged invention therein consisted in the use of paint as a non-combustible insulator for wires. Paint had been used as an insulator before and it was known that paint was non-combustible. As to such matter the Court stated at p. 14:

> "Mr. Cowles was not the first however, to discover that paint was useful for the purpose of insulating electric wires * * *."

and that it had

> "been a matter of common knowledge for many years that paint was practically non-combustible."

In the present case it had never been known in any art that heterodyne amplifiers having an intermediate frequency higher than the signal frequency had rapid sensitivity recovery properties, *nor* was a heterodyne amplifier of any kind used or suggested in the flaw detection art.

In *General Electric Co. v. Jewel Incandescent Lamp Co.*, 326 U. S. 242, 244, 245, the alleged invention resided in frosting the inside of an incandescent light bulb by an etching process "so as to produce an interior surface characterized by the presence of rounded as distinguished from sharp annular devices." The Court found at 326 U. S. 245 that

> "* * * an electric bulb frosted on the inside was old in the art * * *. Moreover, it had long been known in the art that successive acid treatments of glass rounded out the sharp angular crevices produced by the first etching * * * (and) Sprechsaal in 1912

specifically described the application of successive etchings to electric bulbs. And that publication recommended, as Pipkin did years later, that a weaker or diluted etching solution be used for the second etching."

Thus the prior art *in the same art* taught the same steps contained in the patent claim. The only discovery was that such procedure had the additional inherent property of strength. The Court summarized the case as follows at page 247:

"if A without mentioning the element of strength patented a bulb which was extra strong, B could not obtain a patent on the bulb because of its strength, though he was the first to recognize that feature of it. That is the *import of Ansonia Brass & Copper Co. v. Electric Supply Co.*, 144 U. S. 11."

In the present case the use of a heterodyne amplifier has not been taught in the art of flaw detection for any purpose, and the inherent characteristic utilized here in flaw detection has never been recognized or utilized in any other art.

In the *Jewel Incandescent Lamp* case, the Court was careful to show that the prior art was in the *same* art. The Court stated at page 245:

"It is true that these prior publications were concerned with frosting for the purpose of obtaining a decorative finish in glass ware or desired optical effects in focusing screens or cameras and the like. But Sprechsaal in 1912 specifically described the application of successive etchings to electric bulbs."

By implication, if Sprechsaal had *not* applied technique to light bulbs, the patent would have been valid. The Trial Court in the case at bar recognized the distinction.

The District Court aptly distinguished the *Jewel Incandescent Lamp* case as follows (797a):

> "* * * Nor can it fairly be said on the authority of *General Electric Co. v. Jewel Incandescent Lamp,* 326 U. S. 242, that Firestone's use of an old device of a heterodyne amplifier was not invention. Firestone did more than merely recognize a feature or advantage of a heterodyne amplifier as used in the depth sounding art. He used the heterodyne amplifier in the *different* art of non-destructive testing by the *new technique* of the ultra-sonic pulse echo method to effect the novel and useful result of enabling the receiver speedily to recover its sensitivity and reflect the echos from flaws close to the surface of the piece under inspection. Thus, *by the use of imagination and inventive skill,* Firestone adapted an old device to a new use in a different art and achieved an unobvious and useful result. The principle applicable here was well stated in Potts v. Creager, 155 U. S. 597, 607, where it was said:
>
> > 'Indeed, it often requires as an acute perception of the relation between cause and effect, and as much of the peculiar intuitive genius which is a characteristic of great inventors, to grasp the idea that a device used in one art may be made available in another, as would be necessary to create the device de novo.' " (Emphasis added.)

Moreover, whatever the holding of the *Jewel Incandescent Lamp* case, Section 103 of the Patent Act of 1952 supersedes the decision, and specifically limits the test to what would have been obvious to one having ordinary skill in the art to which the subject matter of the invention pertains. Indeed if there is a conflict between the *Jewel Incandescent Lamp* case and Section 103 of the Patent Act of 1952, it is in the interest of the Bench and Bar that the Supreme Court clarify this matter as well.

Re: THE COMBINATION CLAIMS OF THE FOURTH QUESTION.

In order for the Appellate Court to reverse the lower Court on the combination claims, 20 and 26, it was not only necessary to reverse the finding of novelty of the damping and heterodyne elements, but it was also necessary to show that the combination was old. The Trial Court aptly noted (799a) that none of the references cited showed the combination. The Appellate Court cites no references showing the combination. The Appellate Court relied solely on Petitioner's Patent No. 1 stating that the "parts performed the same function and operated in the same way as they did in the original patent." Note that the Appellate Court, in discussing the anticipation of the dampening of the crystal does not cite patent No. 1. The reason the Appellate Court did not is that *patent No. 1 does not contain damping means.* Nor does the Appellate Court cite patent No. 1 as anticipation of a heterodyne amplifier having an intermediate frequency higher than the signal frequency. Patent No. 1 does not disclose such an amplifier. Yet Patent No. 1 is said to anticipate the combination. How can it anticipate the combination if it doesn't anticipate the individual elements that make the combination? The only way that it can is if the element of a damped crystal and a heterodyne amplifier are old in the art *and* operate in the same way. Thus the Court's finding of anticipation of the combination is dependent on the Appellate Court's finding that the elements are old. (Questions 1 and 2 *supra.*)

Moreover, the mode of operation is changed. The use of the heterodyne amplifier with intermediate frequency higher than signal frequency permits recovery of sensitivity in a millionth of a second and the damped crystal permits the crystal to be transformed from a sender to a

receiver ir the same astoundingly short period and the combination thereof, "resulted in detecting flaws closer to the surface than could be done with Patent No. 1." (page 15a of Petitioner's Appendix).

The element of *damping* of the crystal is an *added* element. Claim 20 provides:

> "* * * means in effective contact with the other sensitive surface of said transducer for effectively absorbing waves of the frequency of the waves radiated by said transducer * * *"

Respondent's Brief conveys the impression that Petitioner merely utilized an available ultrasonic crystal having an added echo-free damping block and substituted it for the crystal of the No. 1 Patent. Such is not the case. In fact, prior to Petitioner's invention of the No. 2 Patent there were no ultrasonic crystals having an added echo-free damping block available. Petitioner invented the ultrasonic crystal having an added echo-free damping block and thereby dramatically changed the way in which the crystals transmitted signals. While the crystal of Patent No. 1 radiated wave trains only into the part under test (Fig. 1-847a and 849a), the crystal of patent No. 2 simultaneously radiated two wave trains (in opposite directions), respectively into the part under test and into the damping block (Fig. 6-857a and 859a). The free vibration of the crystal, following the initial pulse, is quickly dissipated by having its energy radiated into the damping block, never to return, so that the crystal is quickly readied to be responsive to echos from nearby flaws within the part under test.

Respondent argues at page 16 of its Brief that it is not invention because the crystal still sends and receives and the amplifier still amplifies. Of course, they do, but they do it in a different way to give a new result. Ac-

cording to Respondent's reasoning the modern radio is not invention over the old crystal set as both perform the same function of receiving broadcasts or that the modern car is not an improvement over the first automobile as they both perform the function of running on the road.

Re: PETITIONER'S THIRD QUESTION.

It has been pointed out above that the Appellate Court erred in not looking to the prior art to determine whether the heterodyne amplifier or the damping of a crystal was old in the art and further erred in basing its holding of anticipation of the combination on such prior errors. The Appellate Court did admit that an improvement took place but characterized it as one of degree and therefore not invention. Would the Appellate Court's ruling have been different had it found novelty in the elements and combination? The Court would have then been confronted with a fact situation wherein new elements were combined in a new combination to yield an improved result, which is the finding made by the District Court. The degree of improvement, the nature of the improvement, and the way in which the improvement is achieved are interdependent. Otherwise, the Appellate Court's holding stands for the proposition that improvements of degree are *per se* not patentable. Under such a theory if one were to invent a carburetor which provided car owners with an additional 20 miles per gallon of gasoline such improvement would be merely degree and therefore unpatentable. An improvement should not be unpatentable because it can be expressed quantitatively and is forthwith designated as an improvement in degree. There can be no *per se* dividing line between patentable degree and unpatentable degree. The degree must necessarily vary from case to case and depend upon the nature

of the improvement, the manner in which the improvement is created, the degree of skill involved therein, and the importance of the degree to the public.

In the present case a limitation in inches in the degree of flaw detection is measured in terms of human life or the success of a mission. This statement was made at page 9 of the Petition and was unchallenged by Respondent. A fraction of an inch difference is only a difference of "degree," but the adverse effects in terms of life or a rocket launching may be absolute.

The Appellate Court admits that the apparatus is an improvement in detecting flaws near the surface. (Page 15a of Petitioner's Appendix.)

In discussing utility at pages 15-18 of the Petition, Petitioner pointed out three errors made by Appellate Court in determining the extent of the "degree" of improvement that existed. Petitioner pointed out that the Appellate Court in arriving at the "degree" of improvement:

(1) Confused "measurement" with "flaw detection."

(2) Overlooked the advantage that a single placement of the crystal permitted detection flaws both close to and far from the sending point (72a, 76a, 185a, 186a, 188a, 189a).

(3) Extracted only a portion of Dr. Firestone's statement from the Record and omitted the extremely important qualification as to frequency which appeared immediately thereafter, and which should have alerted the Court to further inquiry as to the relationship between the comparative results and frequency.

Significantly, Respondent failed to comment on the foregoing errors of the Appellate Court (1) in confusing measuring with flaw detection, and (2) in failing to consider the advantage of detecting flaws both near and far

with a single setting of the crystal due to the frequency advantage. With respect to the second point Dr. Firestone stated for example (75a):

> "* * * I might say, at this point, by way of orienting the successive patents, that my patent number one enabled me, following those techniques with customary frequencies, to detect a flaw approximately an inch from the surface, or farther, but somewhat less if you used a higher frequency. But it is also desirable to use the lower frequency so that you can inspect flaws for a greater distance in the part and at the same time be able to detect flaws closer to the surface, and if the lower frequencies are used then the problem of detecting flaws close to the surface becomes more serious."

At Page 76a the following testimony appeared:

> "Q. Please explain the relation between range and frequency, Dr. Firestone.
>
> "A. Ordinarily we might use 1 to 5 million cycles per second in the wave trains, and if the frequency increases, if you change the crystal and use a higher frequency, there is an increased absorption in the metal as the wave is transmitted through the metal. For instance, in cast iron it is difficult to get reflections at great distances without using the lower frequencies.
>
> "So with patent Number One something like an inch or less was the limiting shortness with the lower frequencies used, whereas with this invention Number Two we can, while using the lower frequencies, get down to about a half-inch and find a flaw within about a half-inch of the surface."

The above excerpts from the testimony were cited at Page 17 of the Petition. The excerpts controvert Respondent's assertion at Page 14 of its Brief that

> "From the disclosures of the patents and the statements and testimony of Petitioner, it is not possible to tell what relative effects are produced by changes

in the frequency of operation, the use of a crystal with high damping or the use of a heterodyne amplifier. There is no evidence whatever to show that the use of a crystal having high damping or the use of heterodyne amplifier would be desirable at low frequencies."

The testimony clearly indicates the frequency advantage and the difference between Patent No. 1 and Patent No. 2, which uses a heterodyne amplifier and damping of the crystal. This testimony was uncontroverted by Respondent.

With respect to Mr. Hitt's statement (Respondent's Brief p. 15), he was referring to an *inherent* sound attenuation characteristic of solid rocket propellants irrespective of the type of device used to detect flaws therein. Unless low frequencies are used, there can be no adequate penetration. It was asserted that Patent No. 1 could detect flaws approximately "a half an inch, or inch" from the surface "depending on the frequency in use." (186a). But such detection was possible with the invention of Patent No. 1 only at high frequencies (76a). However, where solid rocket propellant is involved, it was impossible, with the apparatus of Patent No. 1, to detect flaws even within one inch of the surface, because of the low frequency requirement.

Respondent's argument at Page 15 of its Brief is not directed to the point in issue. Respondent confuses the ability to detect flaws near the surface with the ability to penetrate far from the surface. As stated above, without damping there can *be no* detection near the surface at low frequencies. This is the advantage of Patent No. 2. Thus damping is a prerequisite. The output reduction resulting therefrom (which relates to detection far from the surface) is easily compensated for by stepping up the amplification. If the signal is weak from flaws far from

the surface one skilled in the art knows enough to turn up the volume as one would do with a radio when the signal is weak. But *no* amount of turning up of the volume will result in detection of flaws near the surface at low frequencies except where the device of Patent No. 2 is used.

Patent No. 2 acknowledges this relationship, and the adjustment that must be made. The patent states at Page 2, Column 2 (859a), as follows:

> "2. The free vibration of the crystal 3 must be inhibited by damping means consisting usually in cementing the back of the crystal to a block of Bakelite, lead, or other material which absorbs high frequency waves instead of transmitting them, as shown in Fig. 6. If the free vibration is not damped, the mechanical vibration wave train sent into the part will contain many more cycles than the voltage train which initiated it, and the vibration wave train may be so long as to make it impossible to observe reflections in parts having small dimensions. In large dimensioned parts, however, a considerable free vibration of the crystal increases the sensitivity, so in any given part, the amount of damping to be used is a compromise between speed of indication and sensitivity in detecting small flaws."

Re: THE PUBLIC POLICY PORTION OF PETITIONER'S FOURTH QUESTION.

Part of Petitioner's Fourth Question raises the question of the standard of invention of Sections 101 and 103 of the Patent Act of 1952. Section 101 provides that a patent is obtainable for the invention or discovery of any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof. The Statute specifically recognizes the patentability of an improvement. The Statute does not give improvements

a second class status. Section 103 provides the test of invention. Section 103 does not state that the test shall be more severe for improvement patents. Yet, the Appellate Court in this case holds lack of invention because the improvement is merely a matter of degree. In making such a ruling the Court relied on simple mechanical cases.

Not only does the approach appear to controvert Sections 101 and 103, but it also provides a dangerous precedent where inventions of interest to the national safety, defense, and welfare are concerned. Where the nation may not need a better cigarette lighter, (the *Cuno* case), or grocery handling device (The *A & P* case) the nation does need improved devices for detecting flaws in railroad rails and solid rocket propellants. It is the purpose of the patent laws to stimulate invention in such fields. Invention will be stifled, and inventors will become discouraged, if the Courts apply the same kind of reasoning that is involved in a simple mechanical, or gadget case. Inventors will be of the opinion that it is not worth applying for a patent, or concentrating their efforts in a field where the pioneer work has already been done.

Petitioner is not asking for a *lax* standard of invention. Petitioner is asking that in complex, non-gadget cases, where the subject matter is of interest to the national defense, safety or welfare, or scientific advancement (and not all electronics cases are), that the Courts do not merely dismiss an improvement merely because it is one of degree, but inquire into the nature of the improvement and indicate an understanding of the scientific basis for the improvement before reversing a lower Court. Pronouncements of the Supreme Court derive their meaning from the facts of the case. And where the facts of subsequent cases vary in kind, an unquestioning following of the pronouncements in such different situations may create a new

harm. The trend of the Supreme Court has been to strike down simple improvements in gadgets. In inventions of the kind now at Bar, it is submitted, that it is not enough to hold that the improvement is one of degree, but to inquire as to what kind of degree and as to what the nature of the art is in which the improvement of degree occurs.

Respondent cites *Detrola Corp. v. Hazeltine Corp.*, 313 U. S. 259. The *Detrola* case was prior to the *Cuno* and the *Great Atlantic and Pacific Tea Co.* cases which provide the present guides for the Appellate Courts. Significantly the *Detrola* case was not relied on by the Appellate Court as the *Detrola* case does not stand for the proposition at issue whether improvement of *degree per se* constitutes lack of invention. The *Detrola* case did not involve an improvement of interest to the national defense, safety or welfare. It was not even an improvement, but merely another way of doing the same thing. The *Detrola* case did do one thing, however, which was ignored by the Appellate Court herein, the *Detrola* case discussed the prior art at length and indicated a thorough understanding thereof. If the *Detrola* case provides a guide, it certainly was not followed. Moreover the *Detrola* case was in the radio art which was extremely well developed and sophisticated at the time of the invention. Petitioner was the pioneer in the field of pulse echo flaw detection. The District Court stated as follows at (791a):

> "Before closing the discussion of the validity of Patent No. 1, brief reference ought to be made to the numerous evidentiary facts that strengthen the statutory presumption of validity. *That Firestone was the first to invent an apparatus capable of inspecting solid parts for flaws by the timing of echoes therefrom and measuring such parts by the timing of echoes from the opposite side of a part is beyond question.* Witness after witness for the Defendants attested to the

> priority and highly meritorious performance of the devices manufactured under the Firestone patents. The Firestone invention was described in most laudatory terms in respected scientific publications and unquestionably it filled a long felt need." (Emphasis added.)

The District Court in discussing the improvement patent now in question then stated (798a) as follows:

> "Firestone was the inventor of Patent No. 1 and also invented meritorious improvements of his original device."

and (797a):

> "Thus, by the use of imagination and inventive skill, Firestone adapted an old device to a new use in a different art and achieved an unobvious and useful result."

In *Technidyne Corp v. McPhilben-Keator*, 72 F. 2d 242, referred to at Page 16 of Respondent's Brief the fact situation involved the radio art which was well developed at the time of the alleged invention. This is apparent on the face of the quotation relied upon by Respondent. The quotation states in part:

> "* * * Since the radio art was well developed, the standard of inventive thought to sustain a patented radio tube or circuit necessarily is higher than in the earlier history of the art."

Petitioner's improvement was in the early history of the art. Petitioner pioneered the field, and then, rather than rest on his laurels, he invented a substantial improvement. In his first patent he discovered and disclosed the pulse-echo flaw detection method. In his second he overcame the low-frequency-surface-flaw-detection barrier. Each served a purpose. Each was a break-through in the art. The second invention even resulted in the discovery of a hereto-

fore unknown characteristic of a basic element used for other purposes in other arts. This is surely the kind of achievement encompassed by Sections 101 and 103 of the Patent Act of 1952 and the kind of achievement that Congress intended to be rewarded by the grant of a patent. This is a case wherein this Court would have an opportunity to examine Sections 101 and 103 of the Patent Act and provide a guide for the bench and bar for its interpretation in the present world crisis where the need to stimulate inventions in critical fields is paramount.

Respectfully submitted,

ALBERT R. TEARE,

Attorney for Petitioner.

TEARE, FETZER & TEARE,

DONALD A. TEARE,

Of Counsel for Petitioner.

August 25, 1961.